

Overview of the Second Quarter 2009 Surveillance and Maintenance Report for the LM Rocky Flats Site



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Surface Water Monitoring and Operations



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Pond Operations – Second Quarter 2009

- Terminal Pond Discharges:
 - Pond A-4: May 23 through June 5, 2009 (9.10 MG)
 - Pond B-5: May 19 through June 6, 2009 (12.62 MG)
 - Pond C-2: May 26 through June 4, 2009 (4.84 MG)
- Transfers:
 - Pond A-3 to A-4: April 20 through April 30, 2009 (12.67 MG)
 - Pond A-3 to A-4: June 6 through June 29, 2009 (9.76 MG)
- Pond Levels:
 - As of July 1, 2009, Ponds A-3, A-4, B-5, and C-2 and the Landfill Pond were holding approximately 22.1 MG (22.4 percent of capacity)



October 7, 2009,
Pond Levels

Landfill (21.3 percent)
A-3 (14.8 percent)
A-4 (32.8 percent)
B-5 (20.1 percent)
C-2 (12.1 percent)

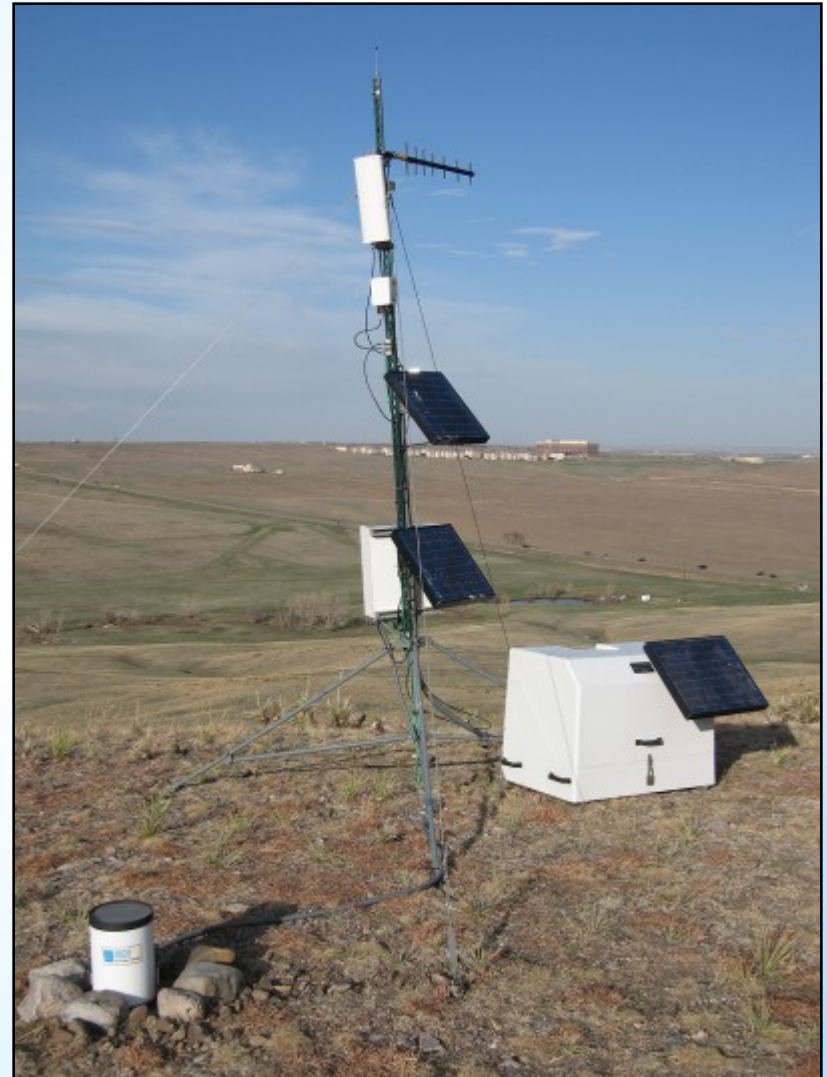
Hydrologic Data – Second Quarter 2009

■ Precipitation

- 7.65" total precipitation
- 144 percent of WY 93-08 average

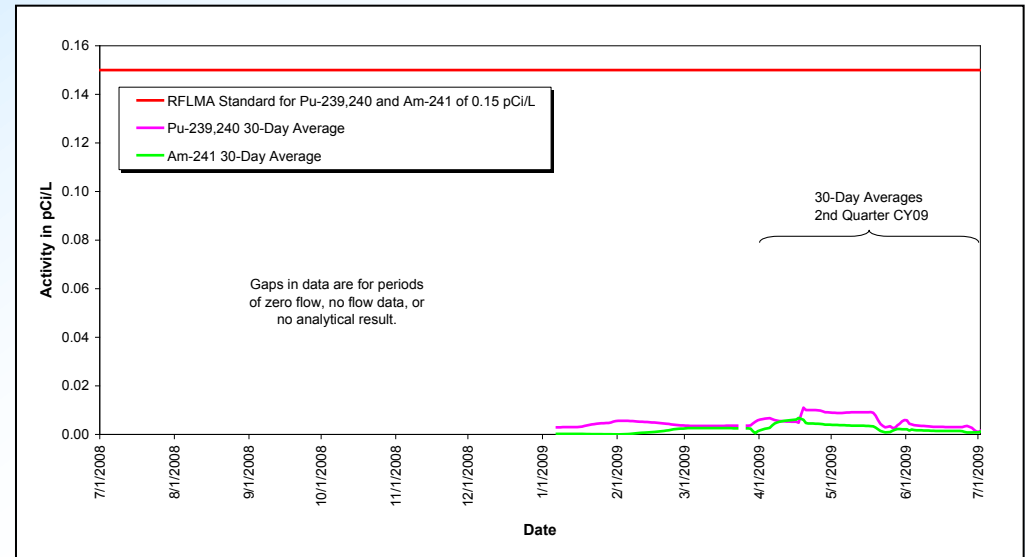
■ Flow Rates (percentage of average):

- GS01 (117 percent)
- GS03 (43 percent)
- GS10 (91 percent)
- SW027 (<1 percent)
- SW093 (111 percent)

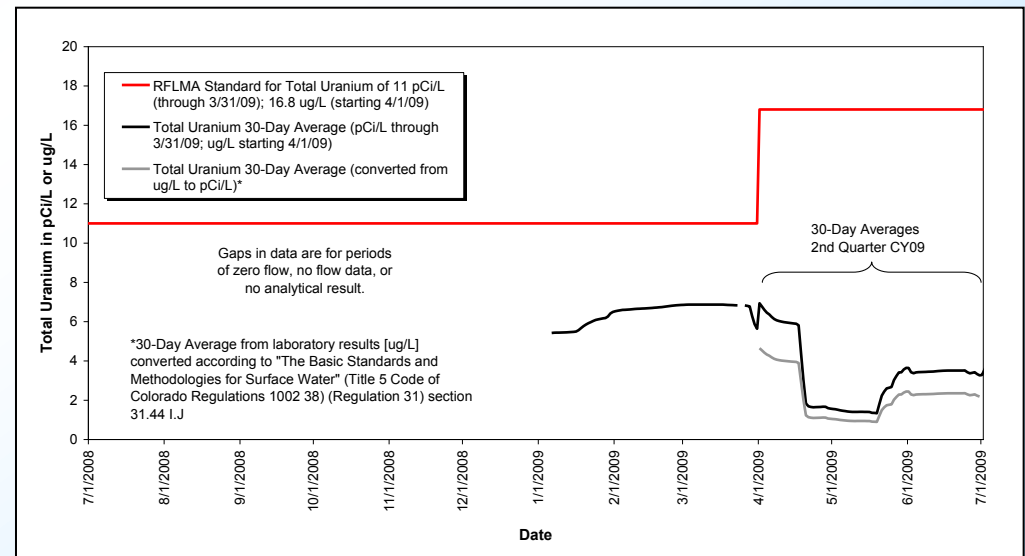


POC GS01

■ Plutonium and Americium

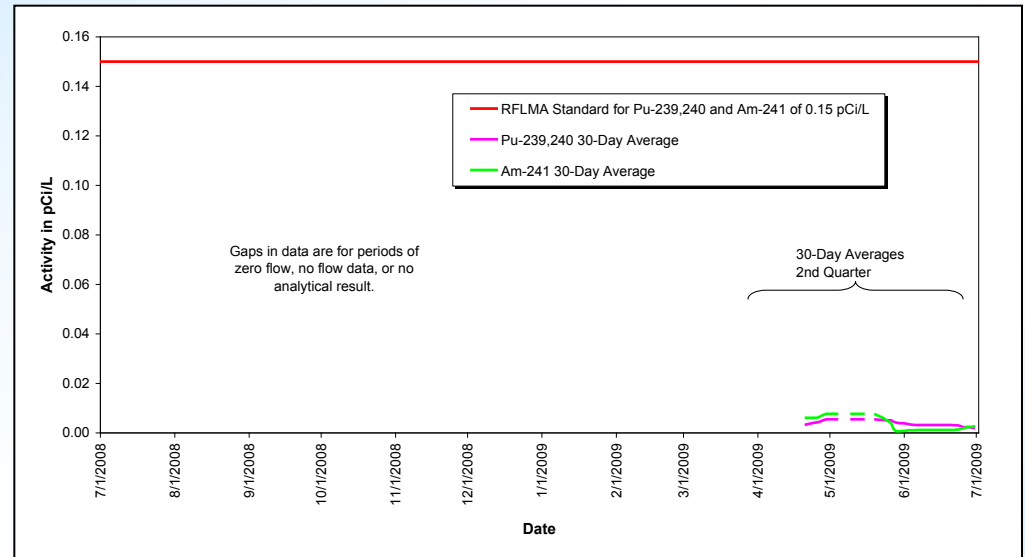


■ Total Uranium

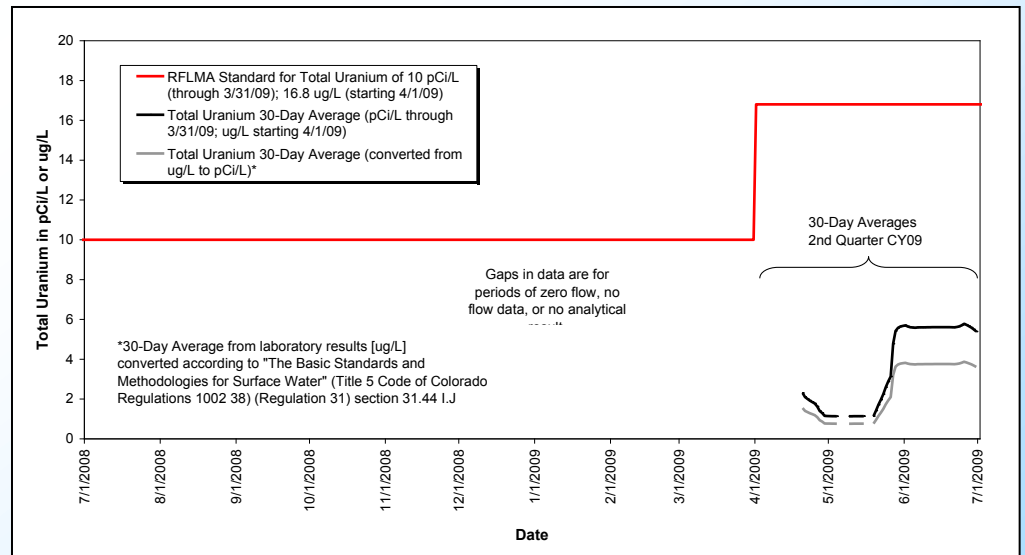


POC GS03

■ Plutonium and Americium

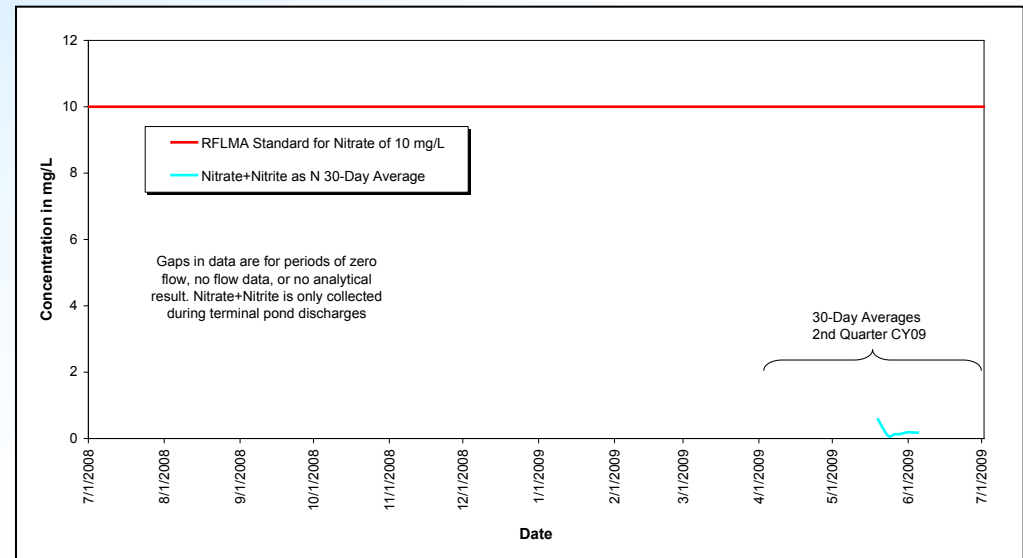


■ Total Uranium



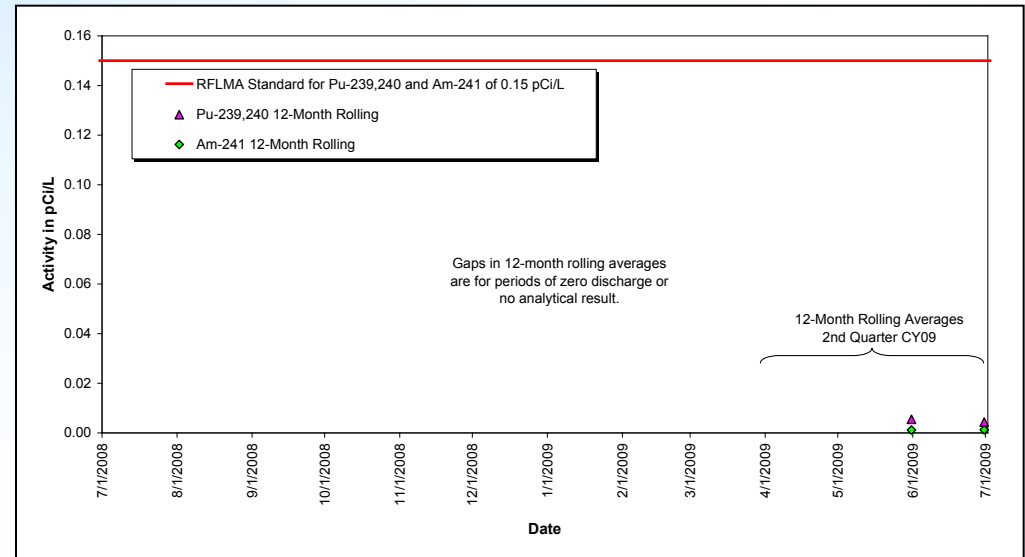
POC GS03

■ Nitrate + Nitrite as Nitrogen

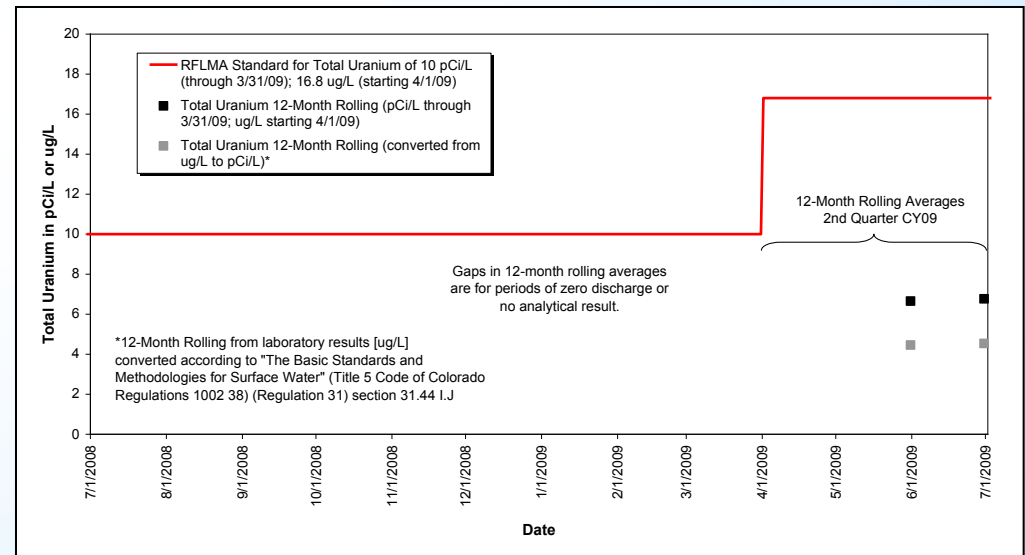


POC GS08

■ Plutonium and Americium

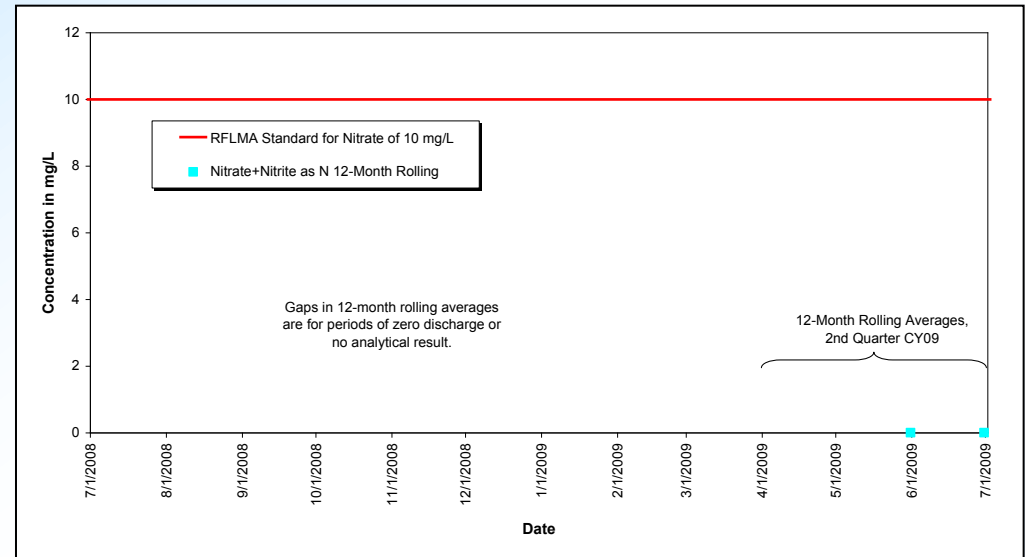


■ Total Uranium



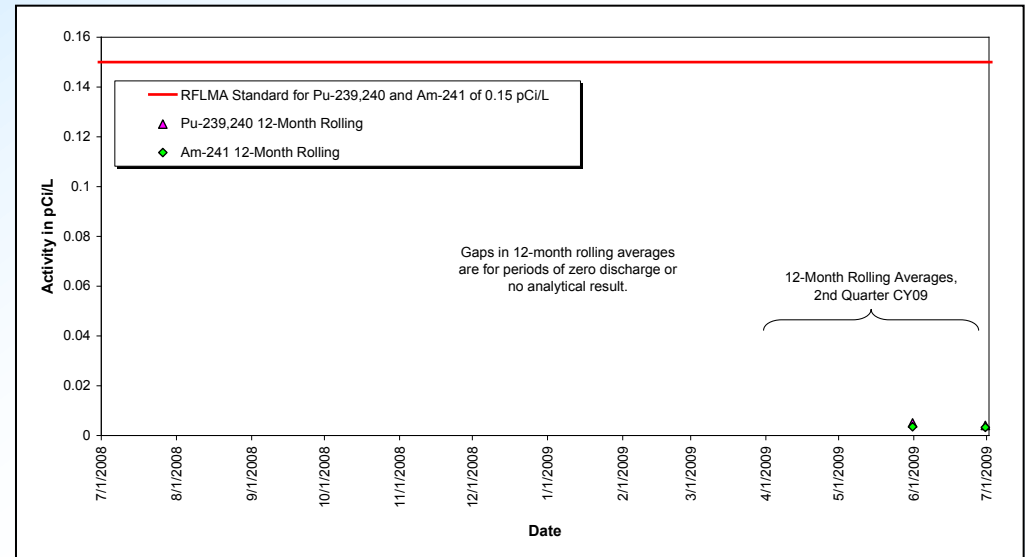
POC GS08

■ Nitrate + Nitrite as Nitrogen

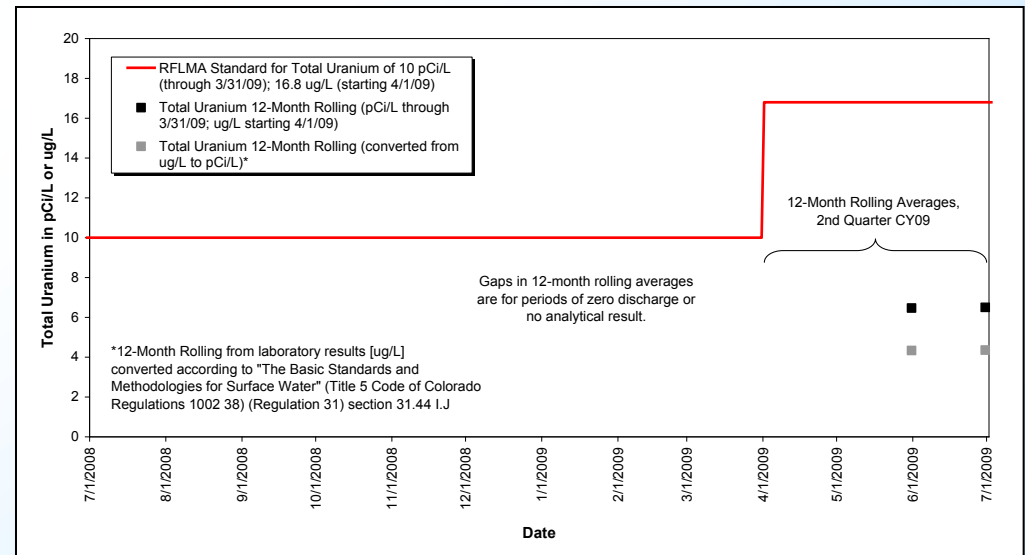


POC GS11

■ Plutonium and Americium

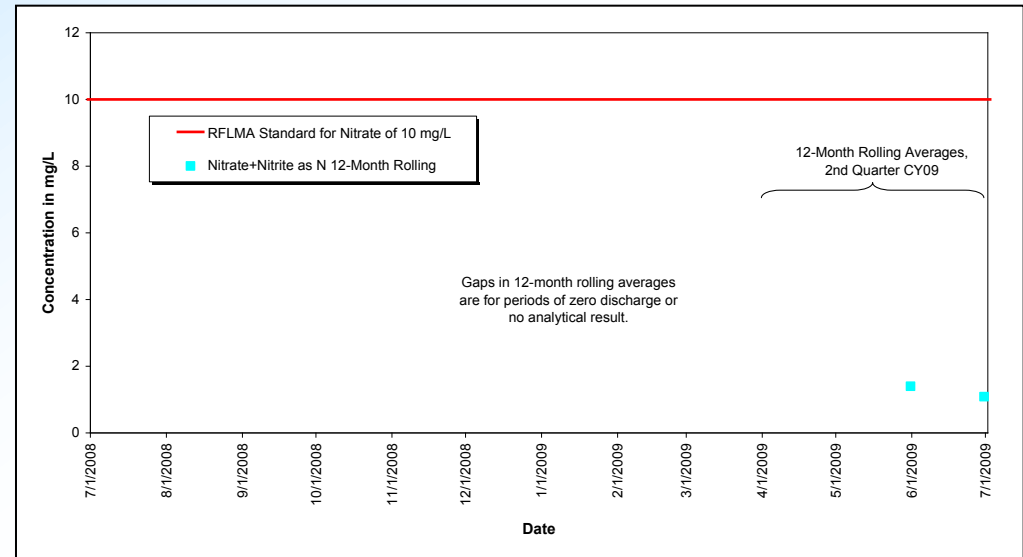


■ Total Uranium



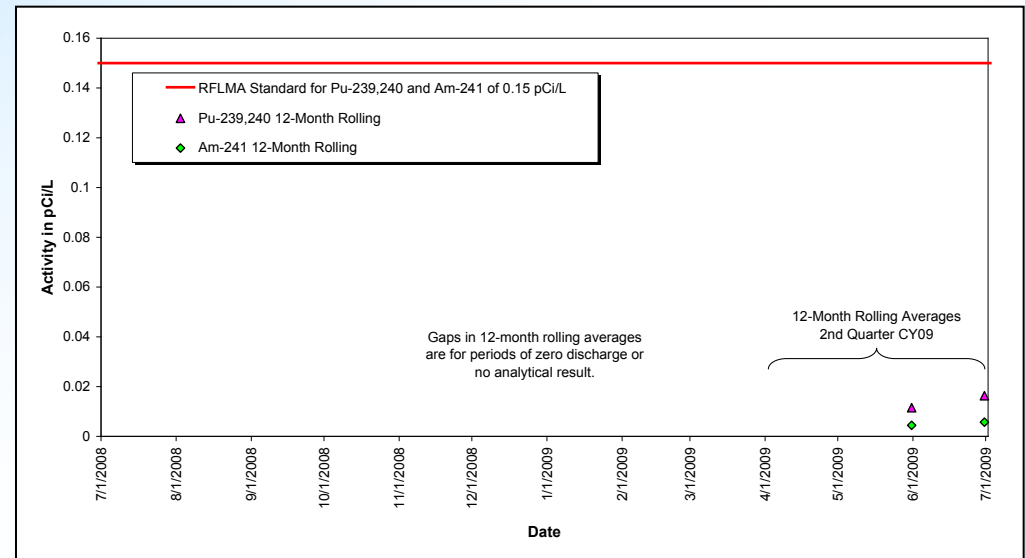
POC GS11

■ Nitrate + Nitrite as Nitrogen

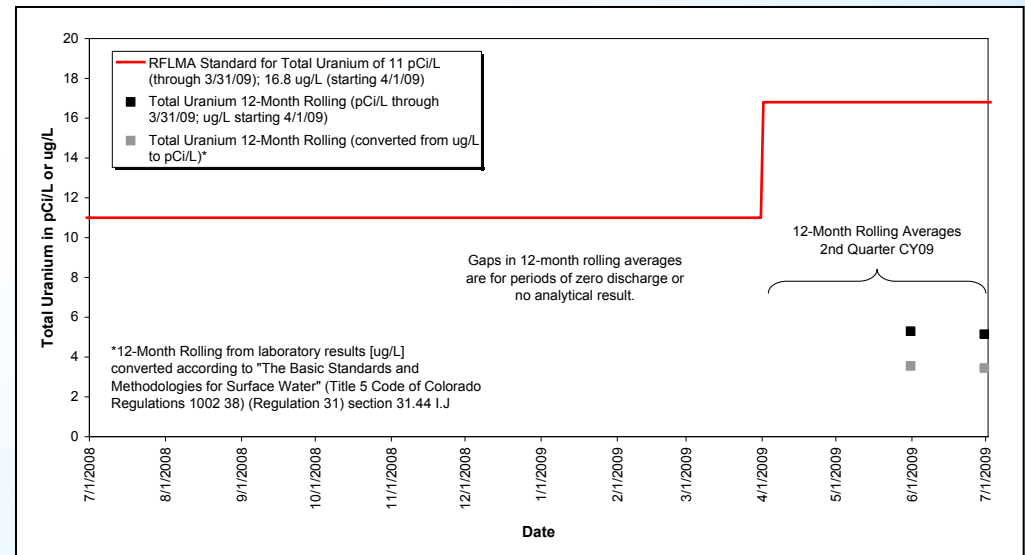


POC GS31

■ Plutonium and Americium



■ Total Uranium



Point of Evaluation Monitoring – Second Quarter 2009

- Water quality at all points of evaluation were below applicable standards.
 - As of the end of April 2009, the 12-month rolling average for total uranium at GS10 is no longer reportable. Precipitation events in second quarter 2009 increased runoff from the GS10 drainage area. A decrease in total uranium to below the reportable level was subsequently observed. This bolsters the conclusion that the reportable uranium levels at GS10 are the result of groundwater baseflow (contaminated with predominantly natural uranium) making up a higher proportion of streamflow due to the reduced runoff after closure.

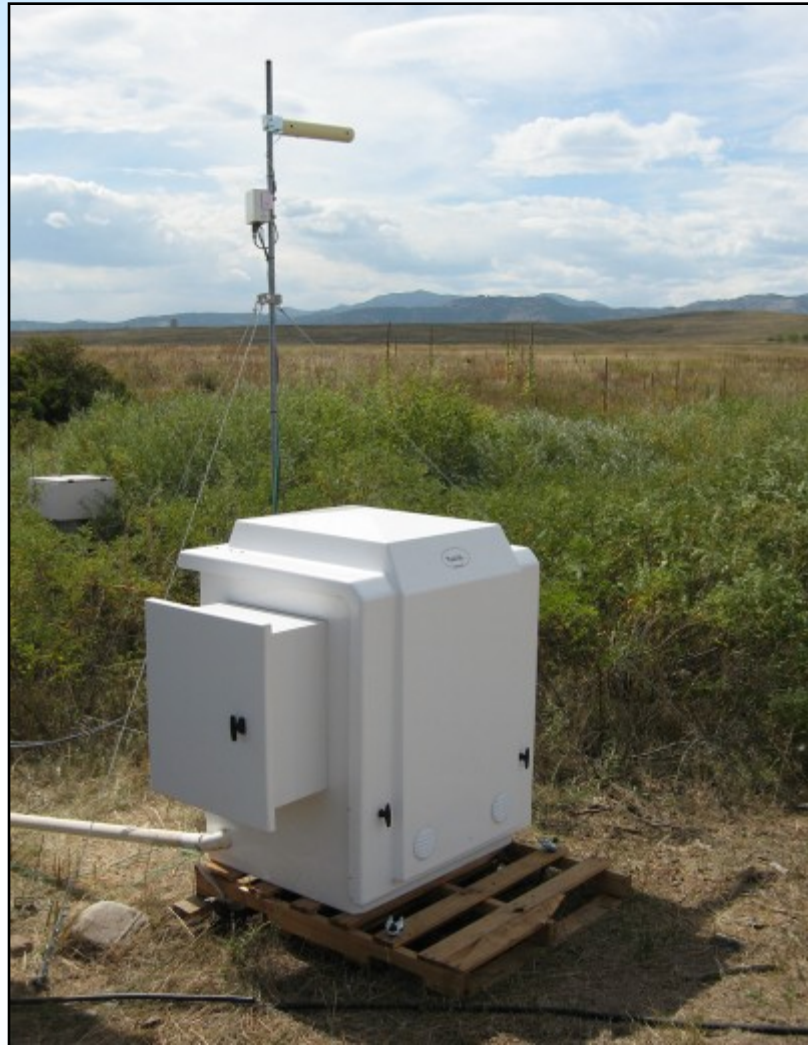


Performance Monitoring – Second Quarter 2009 Original and Present Landfills

- **Original Landfill (OLF):** Surface water quality results during second quarter 2009 showed acceptable water quality.
- **Present Landfill (PLF):** Surface water quality results triggered monthly sampling for vinyl chloride, selenium, and silver.
 - These analytes were not detected in the first monthly sample; monthly sampling was discontinued.



Questions?



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RFLMA Monitoring

- Second quarter is a heavy sampling quarter with the following wells being monitored:
 - All AOC wells and surface water support locations
 - All sentinel wells
 - All RCRA wells
 - All boundary wells
 - All treatment system locations
- No new reportable conditions were observed
- Results will be evaluated in the 2009 annual report



ETPTS Update

- Media replacement and system upgrades project
 - Began September 21, scheduled to be complete October 31
 - Need for media replacement was signaled by reduced media permeability, increasing VOC concentrations in system effluent
 - Revised media design to address permeability issues and improve contact with and effectiveness of media
 - Installing new plumbing vault to simplify changes to flow configuration
 - Improving plumbing design to reduce potential for pipe clogging and to simplify typical maintenance needs
 - Upgrading flow monitoring

SPPTS Update

- Nitrate concentrations at SPOUT (system effluent) remain below temporary modification (TM)(100 mg/L)
- Uranium concentrations at SPOUT have increased
- Phase II: Uranium treatment cell
 - Discontinued citrate dosing of influent
 - Bench tests showed no uranium breakthrough under normal operating conditions
 - Bench tests in which breakthrough was forced resumed uranium treatment after citrate was discontinued
 - Tracer test planned
 - Continued reduced uranium removal suggests potential media short-circuiting
 - Results will be provided and discussed in the 2009 annual report

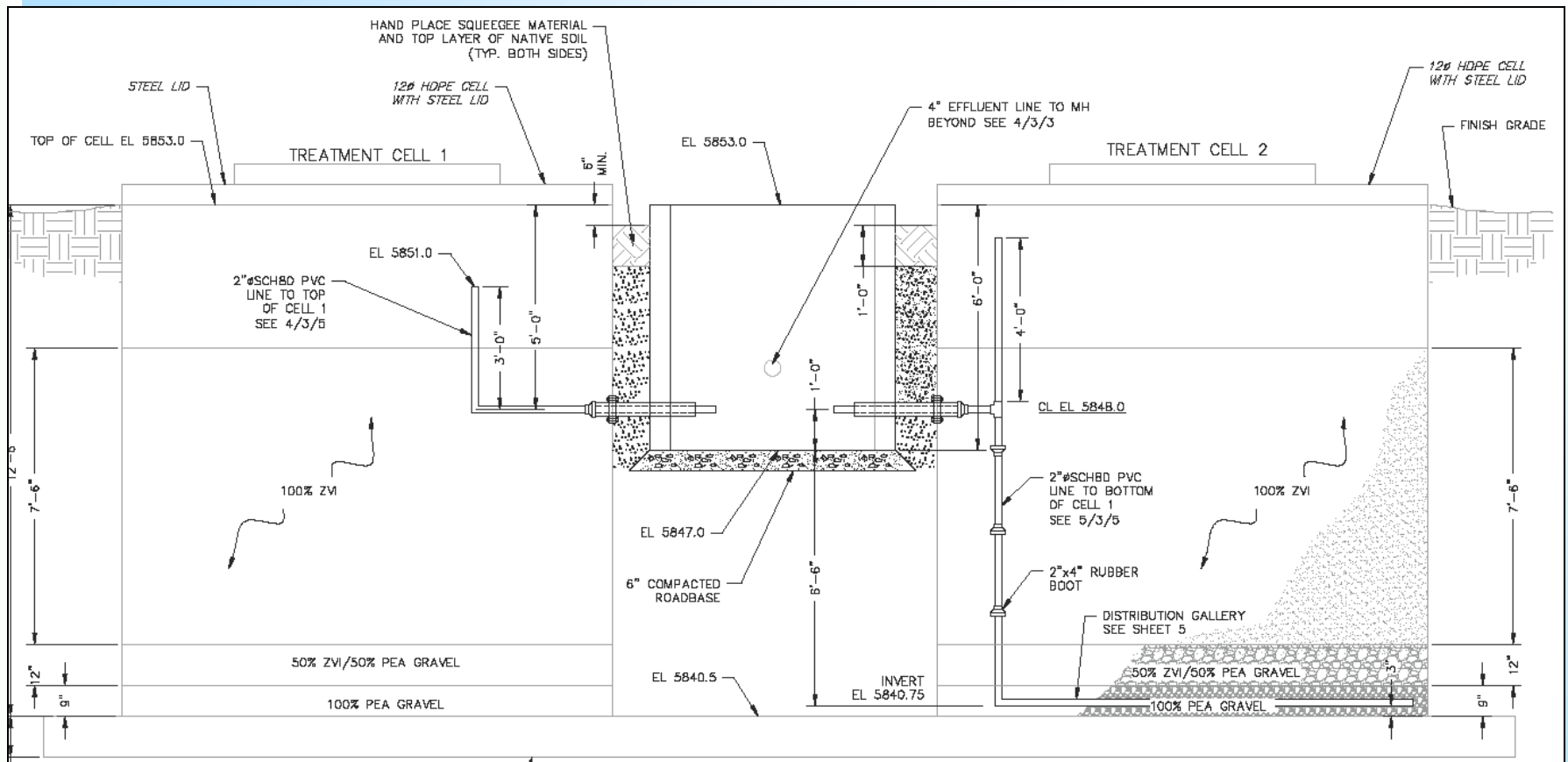


SPPTS Update (continued)

- Phase III: Pilot-scale nitrate treatment study
 - Seeing nitrate removal in both cells
 - Phase III Cell A (inert plastic media) optimization
 - Investigating improvements to treatment via increasing phosphate concentrations in carbon source dosed to influent, increasing recirculation flow rate, and reducing oxygen in recirculated water
 - Phase III Cell B (reactive media)
 - Treatment performance is in line with expectations
 - No optimization necessary

SPPTS Update (continued)

- Results of geotechnical investigation of Phase II and Phase III areas
 - Probable cause of water storage sump settling: Inadequately compacted fill underlying sump.
 - Unable to determine which fill was the cause
 - A 72-inch drain was removed at closure
 - Regrading and North Walnut Creek relocation in late 1970s
 - Other local regrading and backfilling (for instance, construction of SPPTS in 1999)
 - Recommended path forward
 - No structural stabilization needed immediately
 - Helical piers recommended for long term
 - Focus on selected components, based on anticipated use in Phase IV



Section of ETPTS Design Drawings

Update on WQCC Rulemaking

- Triennial review South Platte River Basin: hearing June 8, 2009
 - WQCC revised current arsenic standard (50 $\mu\text{g/L}$) to conform with new statewide water supply standard, effective January 10, 2010
 - New standard will be 0.02 to 10 $\mu\text{g/L}$ (WQCC risk-based water consumption – EPA's maximum contaminant level [MCL] for drinking water supply)
 - Water below MCL (based on 85th percentile of data) is considered in attainment with standard
 - Water at Rocky Flats is in attainment with new standard



Update on WQCC Rulemaking (continued)

- WQCC changed segment 4b recreation use classification from N (no recreation use) to P (potential recreation use) based on establishment of refuge outside of Central Operable Unit (COU), effective January 1, 2010
 - E. coli standard will change from 630/100 ml to 205/100 ml
 - Segment 5 retains N classification
 - Portion of segment 4b now inside COU (from A-4 and B-5 terminal ponds to COU west boundary) will become segment 5
 - Portion of segment 5 outside COU (North Walnut Creek west of COU boundary) will become segment 4b





Update on WQCC Rulemaking (continued)

- DOE did not propose any extension/changes to expiring TMs
 - Current Rocky Flats TMs (six VOCs, nitrate/nitrite) expire December 31, 2009
- Changes to be incorporated in RFLMA Attachment 2, Table 1, Surface Water Standards, as part of planned Attachment 2 modification



Site Operations



Second Quarter 2009



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OLF Inspections

- Monthly inspections at the OLF were completed on April 30, May 26, and June 29
- A vegetation inspection was completed on May 13



OLF Seeps

- Seep 4 had some surface expression, but did not show any surface flow. This is likely due to the rock drain that was installed during the West Perimeter Channel Regrade Project.
- Seep 8 flowed at a rate of 2 to 3 gpm throughout the second quarter
- The West Perimeter Channel flowed at a rate of 2 to 5 gpm throughout the second quarter. The higher rates were noted following precipitation events.
- Seep 7 showed surface expression along the eastern edge of the drain extension installed in September 2008 and from the south edge of the concrete pad for inclinometer 82508I



OLF Seep 7 Drain Extension Adjustment

- As part of the OLF geotechnical investigation, an extension to the original Seep 7 subsurface drain was installed in the OLF cover soil in September 2008
- No surface expression in the Seep 7 area until after precipitation events throughout second quarter CY 2009
 - Seep 7 showed surface flow during all three monthly inspections
- Flow observed along the approximate location of the eastern edge of the drain extension and south edge of casing for inclinometer 82508I
- Potholing on May 14 to evaluate the eastern edge of the drain and connection to the existing drain to determine whether water was flowing within the drain



2008 OLF Geotechnical Investigation – Recap



Seep 7 Expression in Spring 2009



Seep 7 Drain Extension Construction in 2008



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Seep 7 Drain Extension (continued)

- Geotextile fabric wrap not sufficiently porous to allow water to seep into the drain fast enough to carry the water away
- Seepage was surfacing in the vicinity of the eastern edge instead
- Water was freely flowing inside the drain extension and carrying water that enters the drain in the subsurface
- Small section of the geotextile wrapping edge replaced with more porous permanent erosion matting, which immediately resulted in the water entering the drain and the surface area quickly drying up at this location
- Additional sections along the edge adjusted in similar manner to allow water to enter the drain



Seep 7 Potholing – Flow Inside of Geotextile Wrap; Permanent Matting Allows Water to Enter Drain



OLF Settlement Monuments and Inclinometers

- Settlement monuments were surveyed on June 23; data are within the expected range per the OLF Monitoring and Maintenance Plan
- Inclinometers were measured on April 29, May 13 and 14, and June 11 and 16, 2009
- Results showed higher deflection for several inclinometers, most noticeable for the three inclinometers on the west side of the OLF, between diversion Berms 1 and 3 (inclinometers 82208I, 82308I, and 82408I) where deflection was approximately 1.5 to 2.25 inches

OLF Inclinator Deflection

- Seven inclinometers installed in boreholes in 2008 during OLF geotechnical investigation
 - Inclinometers deflect with lateral ground movement



OLF Inclinometer Deflection (continued)

- Movement of the inclinometers has been monitored approximately monthly since installation



OLF Inclinometer Deflection (continued)

- Deflection occurred after a period of heavy precipitation events beginning in April 2009
- Deflection appears consistent with findings from geotechnical investigation: organic layer near bedrock creates weak zone for overlying soil. When lubricated by subsurface moisture from precipitation events, localized movement of the surface soil may occur.
- A qualified geotechnical engineer is evaluating further inclinometer data
- Indicated that signs of localized movement on the cover surface may occur – slumping noted



OLF Observed Crack Location



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OLF Slumps

- Areas where the landfill cover is pushed up or rolling are noticeable on the western end of the OLF between Berms 2 and 3; however, the areas do not have any surface cracks at this time
- A new crack in Berm 1 was observed on April 4, 2009. The crack extended for a short distance through diversion Berm 1 to the north side of the berm and then back to the south side of the berm.
- These cracks were in the same general location of large cracks that appeared in 2006 and 2007
- Completed West Perimeter Channel regrading and channel drain in 2008 to improve stability. Slump not as severe as that noted in 2007.

OLF Slumps (continued)

- Continue maintenance actions to fill cracking to minimize infiltration of precipitation
- The main crack in Berm 1 was observed again on June 20, 2009
- Site staff again repaired the crack with hand tools and the ATV bucket
- Subsequent nonroutine inspections have shown no new movement in the area where the crack was repaired



PLF Inspections and Surveys

- The quarterly inspection was completed on May 26
- No areas of concern were observed
- The vegetation inspection was completed on May 13



Nonroutine Inspections

- A special inspection of the OLF, PLF, and site following a precipitation event exceeding 3 inches was completed on April 20, 2009, as required by RFLMA
- The center of the OLF between Berms 1 and 2 and 4 and 5 showed a small amount of erosion from surface flow following the precipitation event. The area was regraded and seeded by site staff, and erosion matting and wattles were installed to help prevent future erosion problems in the area.
- Another special inspection of the OLF, PLF, and site following a precipitation event of 1.1 inches was completed on March 30, 2009. No problems were observed.

Questions?



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